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APHIS-PPQ

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APHIS 81-46  
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Pest

WHEAT BUG  
Nysius huttoni White

Order: Family

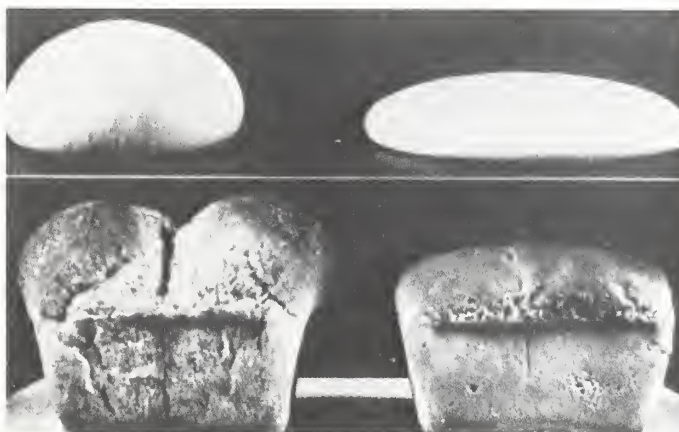
Hemiptera: Lygaeidae

Economic  
Importance

N. huttoni has been known as a pest of wheat in New Zealand since the mid-1930's. Its feeding reduces the weight of the grain but more importantly, adversely affects the flour. Seed germination is unaffected. This lygaeid is also a serious pest of young crucifers; its feeding eventually leads to seedling death ending in poor crop stands. Damage is often severe, especially in dry districts and elsewhere in dry years when serious outbreaks occur (Ferro 1976, Gurr 1957).

Because wheat bug injects an enzyme during feeding, flour from damaged wheat ruins dough during breadmaking (Fig. 1). The enzyme splits adjacent protein chains in dough, breaking down the dough structure, suddenly turning it runny and sticky. This

(Fig. 1)



Wheat doughs and loaves: Left - normal. Right - wheat damaged by Nysius huttoni (From Ferro 1976).

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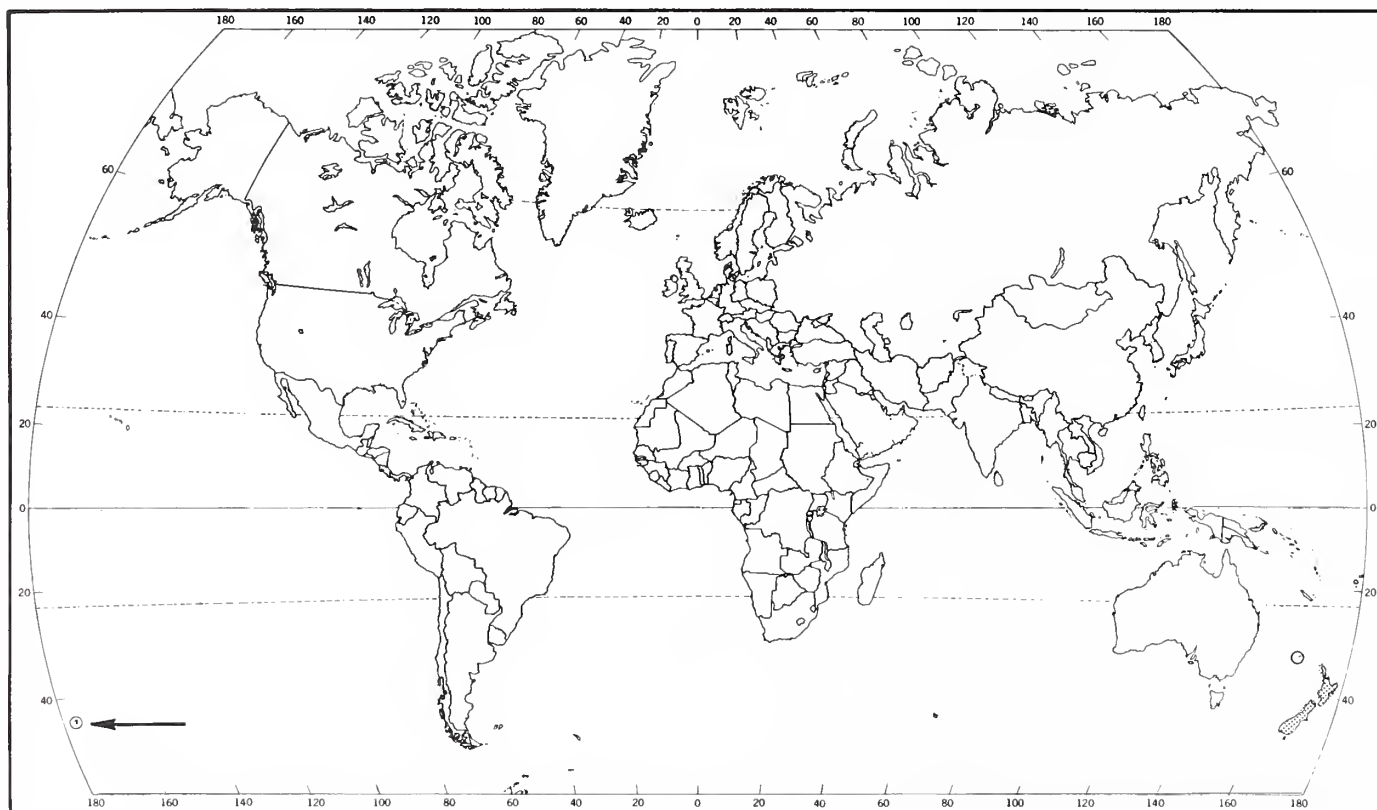
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20560

"sticky dough" or "sticky gluten" gums up bakery machinery. Also, the resultant bread is unacceptable. As few as three to four damaged grains per 1,000 produce flour unsuited for baking (Meredith 1970).

#### Hosts

Brassica napus (rape), B. oleracea, B. rapa, Calandrinia ciliata, Capsella bursa-pastoris (shepherd's-purse), Cassinia leptophylla (silverheath cassinia), Coronopus didymus (swine-cress), Cytisus scoparius (Scotch broom), Fragaria X ananassa (garden strawberry), Lathyrus sp. (pea), Linum sp., Linum usitatissimum (flax), Medicago sativa (alfalfa), Nassella trichotoma, Rubus spp. (raspberries), Trifolium pratense (red clover), Trifolium subterraneum (subterranean clover), and Triticum aestivum (wheat) (Ferro 1976, Myers 1921, Spiller and Wise 1982).



Nysius huttoni distribution map prepared by Non-Regional Administrative Operations Office and Biological Assessment Support Staff, PPQ, APHIS, USDA

General  
Distribution

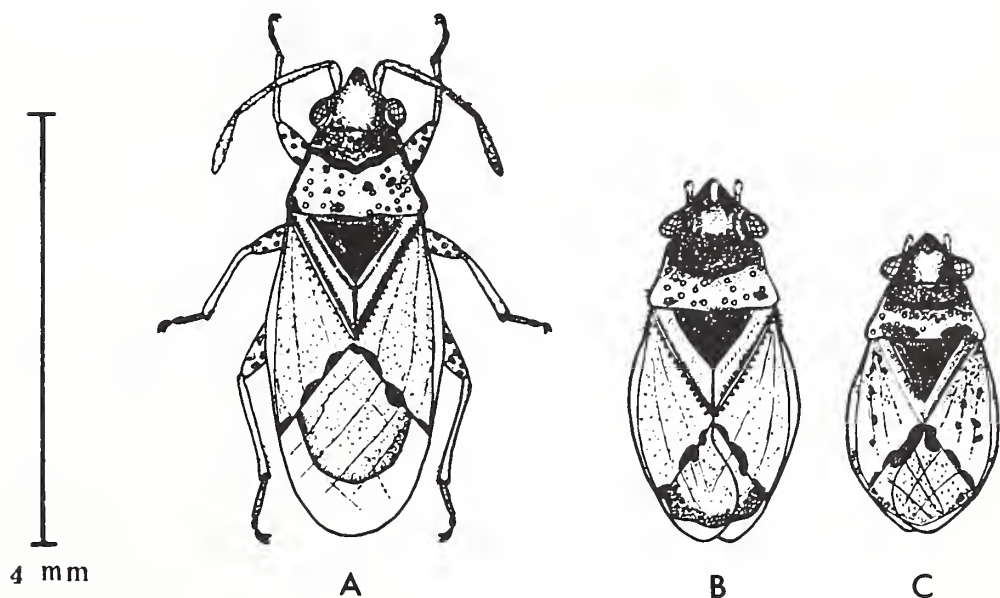
This bug is widely distributed throughout New Zealand including the Chatham Islands and Three Kings Islands (Eyles 1960).

Characters

ADULTS - Length 3.5-4.3 mm, width 1.3-1.8 mm. Dorsally clothed with short, appressed, golden to silvery, sericeous pubescence, intermixed with erect, simple setae. Head wider than long, black, mesal area yellow to reddish yellow. Antennae about twice as long as head width, brown to black, 1st segment sometimes yellowish. Pronotum trapeziform, distinctly punctate, brown, humeral angles and base of meson yellow; scutellum shiny black. Hemelytra brown, variably mottled and spotted with yellow, corial margins uniformly brown, apical margin of each corium bordering the membrane with three dark-brown spots sometimes coalesced into extensive dark area. Membrane nearly clear, cross-hatched with white lines, basal area often fuscous. Undersurface mostly black, abdomen mottled with yellow, coxal clefts yellow. Femora dark brown with apices, dorsal line, and edges broken by yellow, tibiae yellow, tarsi and claws yellow to brown.

Adults can be divided into three size groups: Large, 3.5-4.3 mm long; medium-sized, 3.0-3.8 mm; and small, 2.3-3.2 mm. All individuals of the large group are long winged or macropterous (Fig. 2A), but adults in the medium-sized (Fig. 2B) and small

(Fig. 2)



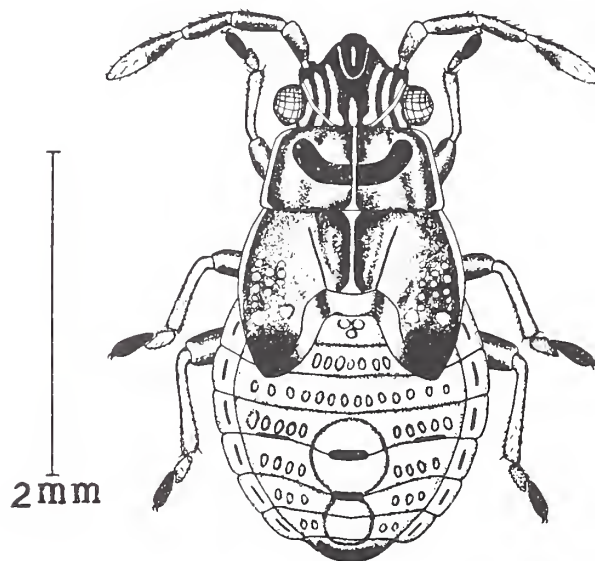
Nysius huttoni, dorsal views: A. Large macropterous adult. B. Medium-sized, sub-brachypterous adult. C. Small brachypterous adult (From Eyles 1960).

(Fig. 2C) groups have three forms ranging from macropterous, sub-brachypterous, to brachypterous (short winged) (Eyles 1960).

EGGS - Oval, length about three times width; mean length about 0.8 mm, mean width about 0.3 mm. Straw yellow to creamy white; cephalic (head) end more orange when first laid, deep orange when about to hatch (Eyles 1960).

NYMPHS (Fig. 3) - Generally pale gray to orange, marked with varying degrees of brown, black, and gray; length from about 0.5 mm in instar I to about 2.0 mm in instar V. Head dark brown to black with longitudinal pale gray to orange stripes. Instars I-IV with pronotum (and wing pads in instars III-IV) dark brown to black; in instar V, pronotum pinkish to gray, variously marked with brown and black, lateral margins and mesal line pale, apex of wing pads and broad U-shaped mark on pronotum black. Dorsal surface of abdomen grayish blue, each segment with transverse row of whitish spots surrounded by narrow red ring. Legs pale brown, spotted with black (Eyles 1960).

(Fig. 3)



Nysius huttoni fifth-instar nymph, dorsal view (From Eyles 1960).

#### Characteristic Damage

Damage to wheat occurs in the milk-ripe stage (Fig. 4), usually in field edges. Affected kernels show a white or pale yellow oval patch up to 2 mm in diameter, usually on the cheek of the



grain (Fig. 5). A black dot in the center of this patch marks the feeding site. Some grains shrink to a cuboid shape when much endosperm is removed, presumably by prolonged or multiple feeding (Ferro 1976, Gurr 1957).

Damage to crucifer seedlings appears generally through a field. A cankerous growth, induced by feeding punctures, ring the stems at ground level. The girdled seedlings collapse on their own or break in high winds (Gurr 1957).

(Figs. 4-5)



4



5

4. Nysius huttoni adults feeding on wheat head. 5. Wheat grain: Left - normal. Right - damaged (From Ferro 1976).

Detection  
Notes

N. huttoni can move as nymphs or adults in commercial shipments of imported fruits and vegetables. Plant Protection and Quarantine (PPQ) inspects these shipments under Title 7, Part 319.56 of the Code of Federal Regulations. If fruits and vegetables are infested with N. huttoni, PPQ requires quarantine action, such as fumigation.

PPQ has intercepted only fully winged adults, possibly owing to their increased mobility by flight. This species was intercepted 13 times in the past 10 years from New Zealand. There were 9 on Actinidia chinensis (kiwi), 2 on Fragaria sp., 1 on Lophomyrtus sp., and 1 on Malus sp. (apple) from cargo. These plant species, except for Fragaria sp., are not recorded as hosts in the available references.

Submit adults for identification in alcohol or mounted dry on triangular points.

## Biology

N. huttoni overwinters as adults under plant debris and at the base of weeds and grasses. Early in the season this pest is associated with weeds, but the bug moves to wheat as most weeds mature and wheat reaches the milk-ripe stage. Adults appear in large numbers during the summer on clover and other plants near wheat crops. They attack seedling cruciferous crops which provide the ideal open ground cover. Adults thrive under hot, dry conditions, preferring situations where sunlight reaches the ground; they are seldom found in dense vegetation. Adults hide under clods or debris on the ground when the temperature begins to fall in the evening and become active in the morning when the temperature rises. Rain inhibits activity (Gurr 1957).

Mating occurs during the summer, with a single copulation fertilizing a female for life. One female may deposit 1-74 eggs, usually in cracks in the soil (Ferro 1976).

Eggs hatch in about 10 days. Nymphs undergo five instars. The complete life cycle takes 50-65 days. There are at least three, possibly four, generations per year (Ferro 1976).

## Literature Cited

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